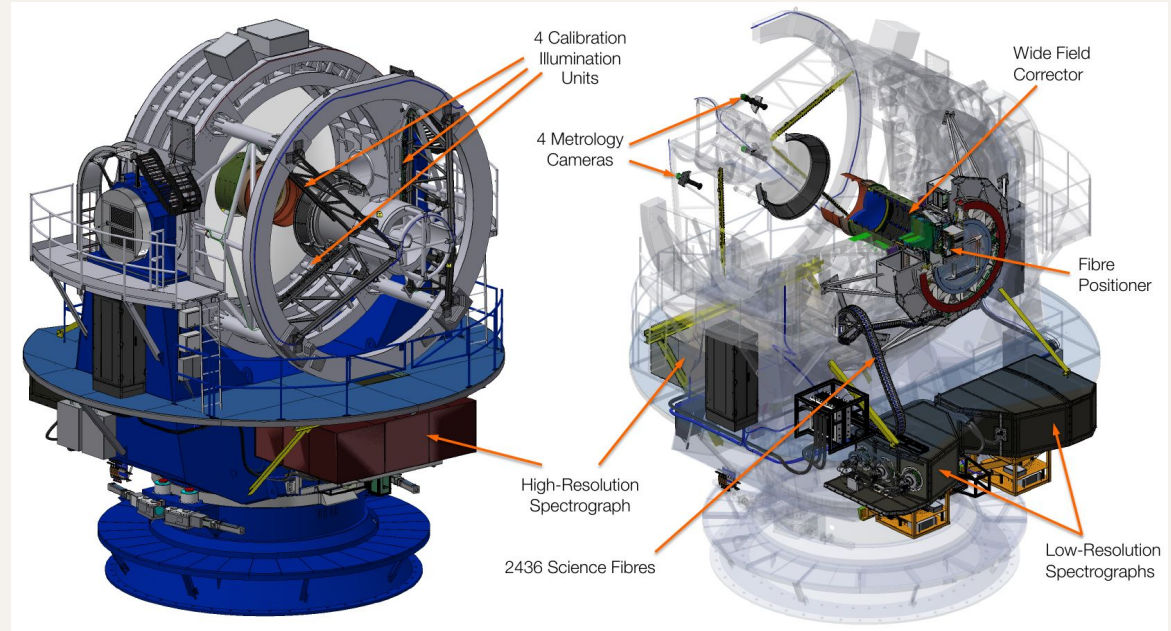

Astronomical Spectra Classification

By Michael Bartlett
Mentors: Dr. Karen Leighly
Alex Parsells

4MOST

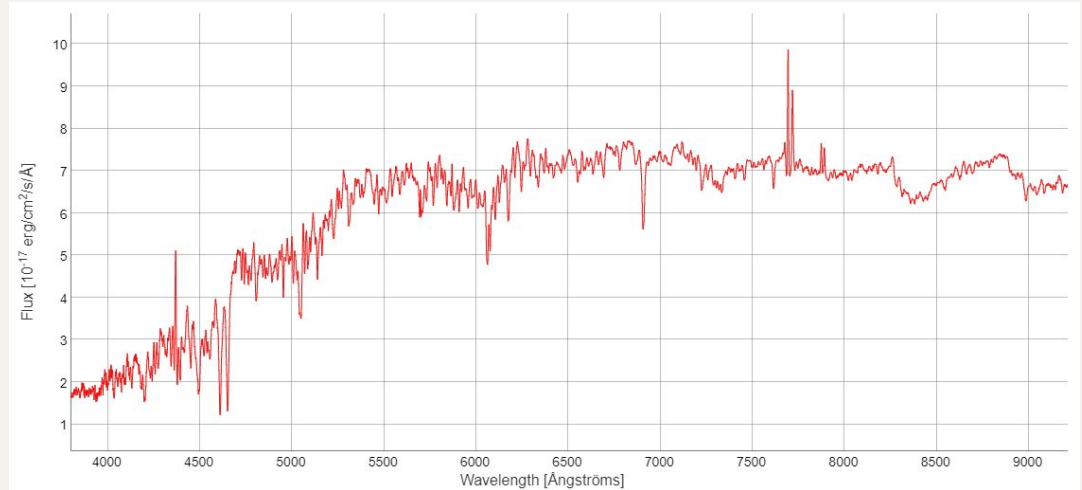
- 4-Metre Multi-Object Spectroscopic Telescope
- Spectroscopic surveys
 - Milky Way Halo
 - Active Galactic Nuclei
 - Cosmological Redshift



ESO 4Most Facility Overview: 4most.edu

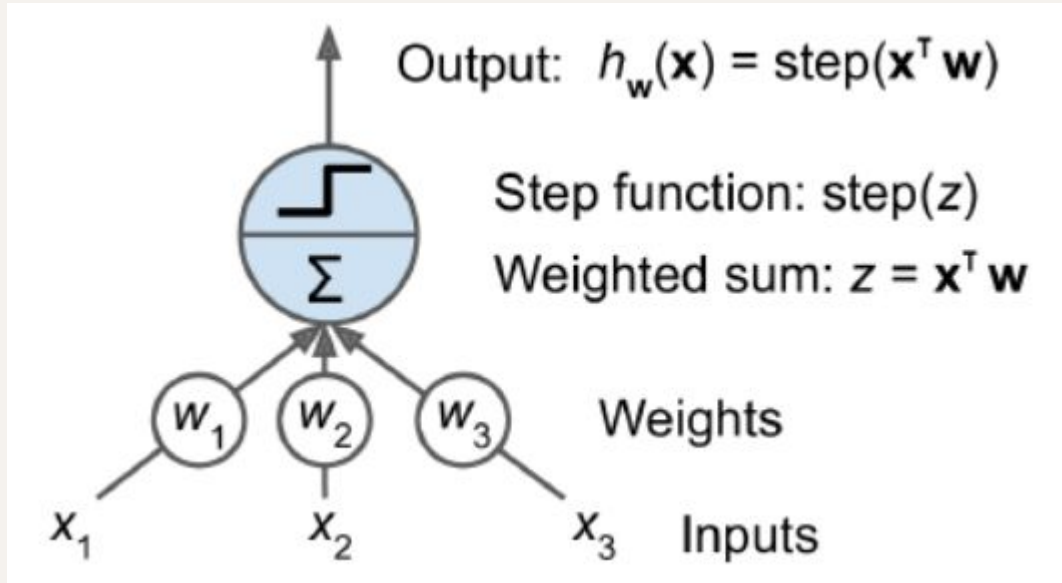
Classification

- 10,000+ spectra per night
- Classifications
 - Stars
 - Galaxies
 - Quasars
 - Broad Absorption Line Quasars



Galaxy Spectra: dr17.sdss.org

Neural Network



- Machine Learning using Neurons
- Convolutional Neural Network
- Able to identify objects independent of position
- Slow to train, quick to classify

Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow. Aurélien Géron

Training Sets

- Sloan Digital Sky Survey Super Set
 - Over 1.4 Million labeled objects
 - Visually Inspected
- Synthetic Spectra
 - Allows for classification of rare objects

Questions?
